Serial No. 10/769,226
Docket No. CM 2597C
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AMENDMENT TO CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

*Listing of the Claims*

1. (Original) A composition for purifying and clarifying contaminated drinking water and which comprises:

(i) a primary coagulant selected from the group consisting of water-soluble, multivalent inorganic salts and mixtures thereof;

(ii) a microbiocidal chlorine-based disinfectant in a level sufficient to cause manganese-associated post-flocculation discoloration of the drinking water;

(iii) an oxidant system providing catalytic or autocatalytic oxidation of soluble Mn(II) to $MnO_2$; and optionally one or more of

(iv) a bridging flocculant selected from the group consisting of water-soluble and water-dispersible anionic and nonionic polymers having a weight average molecular weight of at least about 2,000,000, and mixtures thereof;

(v) a coagulant aid selected from the group consisting of water-soluble and water-dispersible cationic polymers having a weight average molecular weight of less than about 1,500,000, and mixtures thereof;

(vi) a water-soluble alkali;

(vii) a water-insoluble silicate selected from clays, zeolites and mixtures thereof; and

(viii) a food additive or nutrient source

2. (Original) A composition according to claim 1 wherein the weight ratio of primary coagulant to bridging flocculant is from about 10:1 to about 200:1.

3. (Currently Amended) A composition for purifying and clarifying contaminated drinking water and which comprises:

(i) a primary coagulant selected from the group consisting of water-soluble, multivalent inorganic salts and mixtures thereof;
(ii) a microbiocidal chlorine-based disinfectant in a level sufficient to cause manganese-associated post-flocculation discoloration of the drinking water;
(iii) an oxidant system providing catalytic or autocatalytic oxidation of soluble Mn(II) to $MnO_2$;
(iv) a water-soluble or water dispersible polymeric bridging flocculant ~~preferably selected from the group consisting of water-soluble and water-dispersible anionic and nonionic polymers~~, the polymeric bridging flocculant having a weight average molecular weight of at least about 2,000,000, and wherein the weight ratio of primary coagulant to bridging flocculant is from about 25:1 to about 75:1;
and optionally one or more of
(v) a water-soluble or water-dispersible polymeric coagulant aid ~~preferably selected from the group consisting of water-soluble and water-dispersible cationic polymers~~, the polymeric coagulant aid having a weight average molecular weight of less than about 1,500,000;
(vi) a water-soluble alkali;
(vii) a water-insoluble silicate selected from clays, zeolites and mixtures thereof; and
(viii) a food additive or nutrient source.

4. (Original) A composition according to claim 1 or 3 wherein the weight ratio of primary coagulant to coagulant aid is from about 8:1 to about 100:1, the weight ratio of coagulant aid to bridging flocculant is in the range from about 10:1 to about 1:6, and the weight ratio of primary coagulant to microbiocidal chlorine-based disinfectant is from about 10:1 to about 100:1.

5. (Original) A composition according to claim 4 wherein the weight ratio of primary coagulant to coagulant aid is from about 12:1 to about 30:1, the weight ratio of coagulant aid to bridging flocculant is in the range from about 5:1 to about 1:3, and the weight ratio of primary coagulant to microbiocidal chlorine-based disinfectant is from about 12:1 to about 60:1.

6. (Original) A composition according to claim 5 wherein the weight ratio of primary coagulant to coagulant aid is from about 15:1 to about 25:1, the weight ratio of coagulant aid to bridging flocculant is in the range from about 3:1 to about 1:1, and the weight ratio of primary coagulant to microbiocidal chlorine-based disinfectant is from about 15:1 to about 40:1.

7. (Original) A composition according to claim 1 or 3 wherein the oxidant system is capable of reducing the soluble manganese concentration of deionised water containing 150 ppb of soluble manganese by at least about 50% in one minute and by at least about 60% in five minutes, soluble manganese concentration being measured by atomic absorption spectroscopy and the test being run at ambient temperature (20°C) and at a level of the oxidant system sufficient to provide 200 ppb of the autocatalytic oxidant or oxidation catalyst.

8. (Original) A composition according to claim 1 or 3 wherein the weight ratio of primary coagulant to water-soluble alkali is from about 1:1 to about 2:1, and the weight ratio of primary coagulant to water-insoluble silicate is from about 0.8:1 to about 1.2:1.

9. (Original) A composition according to claim 1 or 3 comprising from about 10% to about 99% by weight of the primary coagulant, from about 0.1% to about 10% by weight of the bridging flocculent, from about 0.1% to about 10% by weight of the coagulant aid, and from about 0.2% to about 10% by weight of the microbiocidal chlorine-based disinfectant.

10. (Original) A composition according to claim 9 comprising from about 15% to about 50% by weight of the primary coagulant, from about 0.2% to about 5% by weight of the bridging flocculent, from about 0.5% to about 5% by weight of the coagulant aid, and from about 0.7% to about 2.5% by weight of the microbiocidal chlorine-based disinfectant.

11. (Original) A composition according to claim 10 comprising from about 25% to about 40% by weight of the primary coagulant, from about 0.4% to about 3% by weight of the bridging flocculent, from about 1% to about 4% by weight of the coagulant aid, and from about 0.7% to about 2.5% by weight of the microbiocidal chlorine-based disinfectant.

12. (Original) A composition according to claim 1 or 3 wherein the oxidant system is selected from the group consisting of autocatalytic oxidants, combinations of oxidants and oxidation catalysts, and mixtures thereof, said oxidants having a standard oxidation-reduction potential of at least about 1.23 V, said autocatalytic oxidants and oxidation catalysts being based on transition metals of Groups V, VI, VII and VIII of the Periodic Table.

13. (Original) A composition according to claim 12 wherein the autocatalytic oxidants and oxidation catalysts are selected from permanganates, manganese dioxide and mixtures thereof.

14. (Original) A composition according to claim 13 comprising from about 0.001% to about 0.15% by weight of the autocatalytic oxidant, oxidation catalyst or mixture thereof.

15. (Original) A composition according to claim 1 or 3 additionally comprising as part of the coagulant ~~or otherwise~~ from about 0.005% to about 0.2% of manganese in the form of Mn(II).

16. (Original) A composition according to claim 15 wherein the oxidant system comprises potassium permanganate, the weight ratio of Mn(II) to potassium permanganate lying in the range from about 1:10 to about 10:1.

17. (Original) A composition according to claim 1 or 3 comprising from about 10% to about 45% by weight of the water-soluble alkali and from about 10% to about 80% by weight of the water-insoluble silicate.

18. (Original) A composition according to claim 1 or 3 comprising the primary coagulant, bridging flocculant, coagulant aid, chlorine-based disinfectant and oxidant system in amounts sufficient to provide by weight of the contaminated drinking water from about 75 to about 300 ppm of primary coagulant aid, from about 2 to about 15 ppm of chlorine-based disinfectant, and from about 50 to about 800 ppb of transition metal-based autocatalytic oxidant or oxidation catalyst.

19. (Original) A composition according to claim 1 or 3 wherein the microbiocidal chlorine-based disinfectant is in controlled, delayed, sustained or slow release from whereby the composition has a $t_{max}$ corresponding to the time for achieving maximum disinfectant concentration after addition to deionized water at 20°C of at least 2 minutes and an 80%-ile soluble organic matter flocculation rate ($t_{80}$) of less than 2 minutes.

20. (Original) A composition according to claim 19 wherein the composition has a $t_{max}$ corresponding to the time for achieving maximum disinfectant concentration after addition to deionized water at 20°C of at least 4 minutes and an 80%-ile soluble organic matter flocculation rate ($t_{80}$) of less than 1 minute.

21. (Original) A composition for purifying and clarifying contaminated drinking water and which comprises:
(i) a primary coagulant selected from the group consisting of water-soluble, multivalent inorganic salts and mixtures thereof;
(ii) a microbiocidal chlorine-based disinfectant;
(iii) an oxidant system providing catalytic or autocatalytic oxidation of soluble Mn(II) to $MnO_2$; and optionally
(iv) a water-soluble or water dispersible polymeric bridging flocculant; and wherein the microbiocidal disinfectant is in controlled, delayed, sustained or slow release form whereby the composition has a $t_{max}$ corresponding to the time for achieving maximum disinfectant concentration after addition to deionized water at 20°C which is greater than the 80%-ile soluble organic matter flocculation rate ($t_{80}$) of the composition.

22. (Original) A composition for purifying and clarifying contaminated drinking water and which comprises:
(i) a primary coagulant selected from the group consisting of water-soluble, multivalent inorganic salts and mixtures thereof;
(ii) a water-soluble or water-dispersible polymeric bridging flocculant;

(iii) calcium hypochlorite as microbiocidal disinfectant;

(iv) an oxidant system providing catalytic or autocatalytic oxidation of soluble Mn(II) to $MnO_2$; and optionally

(v) a moisture sink, and wherein the composition has a free-moisture content of less than about 4% by weight thereof.

Claims 23-28. (Canceled)

29. (Added) A composition for purifying and clarifying contaminated drinking water, wherein the water-soluble or water dispersible polymeric bridging flocculant is preferably selected from the group consisting of water-soluble and water-dispersible anionic and nonionic polymers.